the female "as a sort of frenzied process, the fly striking" with its ovipositor twenty or thirty times rapidly, then leaving the animal for fifteen minutes or so, when the process was repeated. The eggs are attached one at a time to the hairs of the cattle and very close to the base of each hair, not near the tip of each hair, where the horse bot-fly deposits its ova. The favourite region for placing the eggs is on the hock and on the back of the knee, or on the flanks, and hence the American cowboys call the insect, "the heel-fly." Undoubtedly by standing with their legs in water the herd is delivered from the pest, at any rate for the time.

The eggs are large, 1.25 mm. in length, and enclosed in a whitish shell, which is prolonged behind into a brownish foot, and this foot, which exudes some sticky secretion, adheres to the ruminant's hairs. The foot of the ovum, in fact, consists of two lobes or valves, which clasp the hair between their sticky inner surfaces.

Within the egg the youngest of the four larval stages is maturing. Later we find such a stage hatched out and within the tissues of the host, embedded in its muscles and membranes, and now the question confronts us, which once confronted George III apropos of the apple in the apple dumpling, "How the devil did it get in?" There seem to be with *Hypoderma* but two modes of entrance into the body of its host, that is, domesticated cattle: (1) The eggs,

Fig. 2.—Warble-fly eggs attached to hairs. Note attachment near base. Slightly enlarged.

or the newly-hatched larvae, are licked up by the tongue, as are the eggs of the horse bot-fly—and this would explain the not infrequent occurrence of the younger larval stages in the walls of the oesophagus; or (2) the larvae bore their way directly through the skin.

Whatever be their mode of entrance, they seem in their second and their third larval stages to wander freely through the tissues, especially through the muscular tissues of the body of their host; usually working upwards, and not infrequently reaching the neighbourhood of the vertebral column, before taking up, in the fourth larval stage, their final position in the "warbles," or subcutaneous cysts.

It seems odd that an insect pest, which so seriously affects our supply of leather, of meat and of milk, should have been studied for over a century and yet conceal its chief secret from man. But the problem is much more difficult than the layman thinks. Professor Carpenter and his staff at Dublin have been trying to solve it for some years. After three years of careful experiment they state, with a good deal of diffidence, that "from experiments," carried on in 1906-7, "with muzzled calves, we conclude that the maggot bores through the skin, and does not enter the beast's body by the mouth." In the next volume of the *Journal* of the Department of Agriculture for Ireland they state: "The experiment with muzzled calves during 1907-8 seemed indeed to support rather strongly the theory of the maggot's entrance by the mouth; but those carried on during 1908-9 tend to confirm the results of 1906-7." The following year again they record: "We are forced to conclude that the prevention of licking in the previous muzzling experiments was less perfect than had been supposed, and to admit that these

later trials support the view that the maggot (or the egg) may gain entrance to the calf's body by the mouth." We cannot yet regard this important step in the life-history of the warble-fly as definitely settled. It may be that both methods of entrance are used. It is so in the tunnel- or hook-worm (*Ankylostoma duodenale*); there the larvae enter both through the skin and by the mouth.

But, whatever be the mode of entrance, and whatever be the route it travels through the body of the calf or cow, by the spring the fourth larval stage, when it is about an inch long, and perhaps half as much in breadth, is reached in the "warble," or cyst, under the skin. Here, nourished by the products of the inflammation it sets up, and breathing by two spiracles at the hinder end of its body, which are directed to the opening of the "warble" which it has pierced through the skin, the larva rests until one fine night it pushes its way, aided by its stout bristles, through the opening and tumbles into the outer world.

Apparently it does not think much of its new environment, for it loses no time in hiding under some clod or stone or crevice in the soil, and straightways turns into a dark brown pupa or chrysalis. This stage lasts three to four weeks, and then the perfect fly emerges, and will soon be ready to lay her eggs on some new victim.

As a rule it is the yearlings who suffer most, and then the two-year-olds, the older cattle being comparatively immune. The inexplicable terror which the warble-fly induces in its victims is testified to on all hands, but has never been adequately explained. *Hypoderma* does not bite, neither does it sting. Many other blood-sucking insects, whose puncture must involve some pain, are tolerated by cattle with a flick of the tail, or are frightened off by a gesture of the head, but the presence of the warble-fly induces a mysterious fear which rapidly spreads through a herd, and results in a general stampede, often referred to by cattle breeders as the "gad." This terror communicates itself even to the "stalled ox," and cattle confined within cowsheds show symptoms of extraordinary unrest when the fly is abroad amongst their kin in the pastures. The resulting evils are, of course, far graver in the unlimited prairies of the West—the great cattle-breeding districts of the United States and Canada—than in our carefully hedged or fenced meadows. A great many "dips," ointments, and chemical solutions have been recommended for the prevention of the grubs in cattle, but none have proved really satisfactory. The tedious method of removing the grub from the tumour is the only safe one. This can be done by the mere pressure of the fingers when the grub is nearly mature and ready to leave its host, or by the use of small forceps should the grub be young and recalcitrant. Once removed, the grub should at once be destroyed, and some such antiseptic as coal-tar applied to the vacated tumour.

MEDICAL WORK IN THE EARLY SEVENTIES IN A COUNTY INFIRMARY IN ULSTER.

BY

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WHEN one, like myself, has come to be a superveteran, and has trod the *via medicalis* for almost half a century, one feels that one's feet have become inured to the hills and hollows and the hardships of the road. On looking back on those pre-antiseptic days the first impression is one of sorrow—sorrow for the many failures and for the many lives we now know were lost. That sorrow is, however, tempered by the thought that the work done was good work and that it was the best that could be done in those early days. It is well to remember that we were but the pioneers, doing rough work it is true, but still good work that laid the foundations for medical science as it is to-day.

Like all others of those times who elected to become doctors it was necessary to become apprenticed to some medical man and then learn the rudiments. I was apprenticed to Dr. Thompson of Lisburn, who was then surgeon to the Co. Antrim Infirmary. To attend at his house or

* An address delivered at the winter meeting of the Division.

the hospital I had to walk five miles and, when done with work, walk those five miles again. It might be well here to compare this with the modern mode of going through a medical education. Dr. Thompson was a man of most striking character. Though kindly at heart, he had a most aggressive and dogmatic manner. If he said a patient would not live, it was said in such a way that you felt the patient must die. There was no court of appeal, as it were. Dr. Thompson, by the way, was the first surgeon in Ireland to perform an ovariectomy.

The hospital itself was very primitive. There were 50 beds; mattresses were of straw and not of the best quality. Off each ward was a w.c. of sorts in a small room, the floor and walls lined with lead. Urinals were unknown. For the whole 50 beds there was one bath, which was situated in the basement, and consisted of a long wooden box lined with lead and let into the floor. To get into it one had to go down some steps. Few indeed were the baths taken. A room was set apart for operating in; there were shelves and presses for holding cases of instruments, dressings, etc. The operating table was a narrow wooden one; the instruments were few, but of good quality. There were no antiseptics of any sort. Pus was a laudable thing and looked upon as natural and therefore healthy. Plain water, not even boiled, was used to wash up any blood or discharge. A large tub, full of freshly dug earth, was always placed under the operation table before an operation. The equipment of the surgeon consisted of the oldest coat he had. Operation after operation did not tend to improve this garment, either as to cleanliness or appearance. The surgeon was careful to wash his hands after the operation, but not before. The ligatures were strong thread taken off a spool and rubbed over a piece of wax. Indeed, the important preparations for an operation were the tub of earth and the waxed thread. The staff of the hospital consisted of the doctor, two nurses, and a porter. It was the custom in those days for the doctor, when going round the wards, to keep his hat on. The wards were visited only in the morning. The two nurses were very much of the Sarah Gamp type. They were not characterized by either cleanliness or sobriety. So long as the intoxication remained in the early or mild stage it was overlooked. These nurses had to sleep in the wards, and, considering their sobriety—or want of it—it was not surprising that their sleep was sounder than most of the patients'. The porter slept in the male ward.

The first operation I attended was an amputation through the thigh. The patient was not allowed to lie down. The leg was brought well out over the edge of the table. The porter sat straddled-legged on the table and supported the patient, who had to stand the sight and pain as best he could.

This, then, is a small picture of a county hospital in those early days. When I compare it with what it is to-day, replete with all sanitary conveniences, electric light, x-ray installation, and modern asepsis, the comparison is awful.

In 1882 Dr. Thompson was killed, and I was appointed in his stead. It is with pardonable pride that I reflect that I have been in this hospital, boy and man, for so many years, and that these improvements have taken place under my care. Like all others, we passed through the pre-antiseptic days, the antiseptic, and now the aseptic.

The medical side was somewhat on the same lines. The constant treatment for all and sundry was large linseed poultices and a liberal amount of medicine. Comparing the past with the present, medicine itself has changed little save in the refinement of drugs, synthetics, and vaccines. Diagnosis is much altered for the better, though I doubt if the diagnostic power of the individual is much improved. It is in midwifery one sees the greatest changes. When I started practice nothing pertaining to the lying-in patient was to be altered, changed, or washed, and if water came near her skin it was looked upon as very bad management. The midwives were those of Charles Dickens's description—in most cases ignorant, unclean, and intemperate. The nightdress of the patient, no matter how soiled, was not to be changed before the eighth day. The same rule applied to the bed sheets, etc. As clinical thermometers were not in use a patient had to be bad indeed before much notice was taken of it. On one occasion, when called to a maternity case and finding

labour tedious, due to an overfull bladder, I drew off the urine with a silver catheter. This must have impressed the women who were in to help the patient. Labour came on quickly after this, and the patient delivered herself. Shortly after this, when attending a breech case, I explained it would be slow and went home to wait. The women in the house must have had a consultation, for they sent one of their number to see if I would not "draw off the child" with the "wee horn" I had used on Mrs. X.

Such, then, are some of my experiences in hospital and private practice. From a scientific standpoint they may not amount to much, but they are worth recording to show the difficulties that had to be faced in those days.

To my younger colleagues I hope they will be interesting and also instructive—interesting, in that they will tell them of a period of which they have only read; instructive, in that they will see that though ignorant of the vast amount of present-day medical science, we yet managed to do work that has lasted and has been fruitful.

[Dr. St. George showed photographs of 3 cases operated on by himself in 1884: (1) Tarsectomy; (2) Macewen's operation; (3) rhinoplasty; and also referred to his having performed suprapubic cystotomy in 1883.]

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

LOCALIZATION OF BULLETS AND METALLIC FOREIGN BODIES.

THE importance of this subject cannot be over-estimated at the present time. Sir James Mackenzie Davidson's interesting experiments with a telephone attachment to knives, forceps, etc., described by him in the *JOURNAL* of January 2nd, reminds me of a piece of apparatus I designed and used with complete success a few years ago. My apparatus assists the surgeon to find a metallic foreign body with a minimum amount of incision, and is especially useful when the foreign body is lying among fragments of bone, or adjacent to bony prominences, such as the processes of the spinal vertebrae. It is so simple that it can be improvised by any one possessing a dry cell or a 2-volt or 4-volt motor-car accumulator, and a small electric bell.

Although my apparatus has probably been devised and used by others, I have never read a description of it in the press, and venture to send you the following description:

A is a dry cell or small accumulator; B, a small electric bell or voltmeter; C, C, two steel needles 4 or 5 in. long; D, flexible insulated wire.

One piece of flexible wire is attached to one terminal of the dry cell or accumulator, and the other end of the wire is fixed to one of the needles by means of a brass screw terminal or by soldering. The other terminal of the dry cell or accumulator is connected up by a piece of wire to one terminal of the electric bell or voltmeter, and the other terminal of same to the other needle as above described.

The method of use is as follows: One needle is driven in either through the unbroken skin or from the bottom of an incision already made in the direction where the foreign body is suspected to lie. This is repeated until the needle is felt to hit something hard. When this takes place the other needle is inserted close to and parallel with the first, but not touching it until it strikes the same substance. If this substance is metallic the bell will at